

## CLAIMS

We claim:

- 1 1. A method comprising:  
2 allocating a first portion of a first memory as a static section to store a main  
3 program which uses functional programs stored in a second memory; and  
4 allocating a second portion of the first memory as a dynamic section to store other  
5 programs, the dynamic section including a plurality of overlay spaces to overlay the  
6 functional programs loaded from the second memory to conserve memory capacity of the  
7 first memory.
- 1 2. The method of claim 1, wherein the allocating of the overlay spaces is determined  
2 by similar functions performed by the functional programs that are to be loaded into the  
3 overlay spaces.
- 1 3. The method of claim 1, wherein in allocating the overlay spaces, individual  
2 overlay spaces have entry and exit points for functional programs loaded into respective  
3 overlay spaces.
- 1 4. The method of claim 1, further comprising accessing a functional program from  
2 the main program by specifying a resource identifier to identify a particular functional  
3 program and an entry address to identify an entry point into one of the overlay spaces.
- 1 5. The method of claim 1, wherein the allocating of the first and second portions are  
2 allocated on the first memory resident on an integrated circuit and the functional  
3 programs to be loaded into the overlay spaces are resident on the second memory external  
4 to the integrated circuit.
- 1 6. A method comprising:  
2 executing a program statement of a main program to perform a particular  
3 functional operation by identifying a corresponding functional program using a resource  
4 identifier and by specifying an entry point into one of the overlay spaces;  
5 using the resource identifier to identify a corresponding functional program to  
6 perform the particular functional operation;  
7 loading the functional program into an overlay space specified by the specified  
8 entry point; and  
9 executing the functional program in the overlay space.

1 7. The method of claim 6, wherein the loading the functional program into the  
2 overlay space loads the functional program into a specified overlay space assigned to  
3 program functions having similar performing tasks.

1 8. The method of claim 7, wherein using the resource identifier is achieved by  
2 loading the resource identifier into a register and reading the register to call the functional  
3 program into the specified overlay space.

1 9. The method of claim 8, wherein executing the functional program also includes  
2 calling at least one other functional program, in which functional programs are nested for  
3 overlaying.

1 10. The method of claim 8, further comprising returning to the main program after  
2 executing the functional program in the overlay space.

1 11. An apparatus comprising:

2 a first memory having a first portion as a static section to store a main program  
3 which uses functional programs and a second portion as a dynamic section to store other  
4 programs which reside in the first memory for a shorter duration than the main program,  
5 the dynamic section including a plurality of overlay spaces to overlay functional  
6 programs; and

7 a second memory operably coupled to store the functional programs and to load a  
8 functional program specified by a resource identifier in the main program to a  
9 corresponding overlay space specified by an entry point specified by the main program.

1 12. The apparatus of claim 11, wherein the first memory is a random access memory  
2 resident in an integrated circuit and the second memory is an external memory to the  
3 integrated circuit.

1 13. The apparatus of claim 12, wherein the second memory is larger in capacity than  
2 the first memory, but in which the functional programs are loaded into the overlay spaces  
3 to allow overlay in use of the functional programs.

1 14. The apparatus of claim 13, wherein individual overlay spaces are assigned to load  
2 program functions having similar performing tasks.

1 15. A multi-function handheld device comprising:

2 a system on a chip integrated circuit that includes an internal memory arranged to  
3 have a first portion as a static section to store a main program which uses functional

4 programs and a second portion as a dynamic section to store other programs which reside  
5 in the internal memory for a shorter duration than the main program, the dynamic section  
6 including a plurality of overlay spaces to overlay the functional programs; and  
7 an external memory operably coupled to the integrated circuit to store the  
8 functional programs and to load a functional program specified by a resource identifier in  
9 the main program to a corresponding overlay space specified by an entry point specified  
10 by the main program.

1 16. The multi-function handheld device of claim 15, wherein the internal memory is a  
2 random access memory and the external memory is a flash memory device.

1 17. The multi-function handheld device of claim 15, wherein the external memory is  
2 larger in capacity than the internal memory, but in which the functional programs are  
3 loaded into the overlay spaces to allow overlay in use of the functional programs.

1 18. The multi-function handheld device of claim 15, wherein the functional programs  
2 are assigned to a particular overlay space based on having similar performing tasks.

1 19. The multi-function handheld device of claim 15, wherein the integrated circuit  
2 includes a register to load resource identifiers, which are then read to load the functional  
3 programs.